



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

JOHN ELIAS BALDACCI
GOVERNOR

DAVID A. COLI
COMMISSIONER

June 6, 2003
Subject: Windham / Westbrook
Project No. F-NH-014P (58) E
PIN No. 2850.10
Bid Amendment No. 5

Dear Sir/Ms.:

Please make the following changes to your Bid Package:

1) In the "Schedule of Items", dated 030602 make the following changes.

- a.) Item # 411.10 "Untreated Aggregate Surface Course (Truck Measure)", change the quantity from "1500.000 M3" **to now read "5000.000 M3"**.
- b.) Item # 629.05 "Hand Labor Straight Time" change the quantity from "10.000 HR" **to now read "200.000 HR"**.
- c.) Item # 631.12 "All Purpose Excavator (Including Operator)" change the quantity from "15.000 HR" **to now read "50.000 HR"**.
- d.) Item # 631.172 "Truck Large (Including Operator)" change the quantity from "15.000 HR" **to now read "50.000 HR"**.
- e.) Item # 631.22 "Front End Loader (Including Operator)" change the quantity from "10.000 HR" **to now read "25.000 HR"**.
- f.) Item # 652.38 "Flagger" change the quantity from "5000.000 HR" **to now read "15000.000 HR"**.

Make these changes in pen and ink.

2) Delete in its entirety Special Provision Section 309 "Full Depth Recycled Pavement (With Foamed Asphalt)" 6 pages dated May 27, 2003, and replace with the new attached Special Provision Section 309 "Full Depth Recycled Pavement (With Foamed Asphalt)" 6 pages dated June 6, 2003.

3) Delete in its entirety Special Provision Section 309 "Foamed Asphalt (Mix Design)" 1 page dated March 21, 2003.



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4) On Plan sheet # 5 of 280 Titled Estimated Quantities and Earthwork Summary make the following changes.

- a.) Item # 411.10 "Untreated Aggregate Surface Course (Truck Measure)", change the quantity from "10230.000 M3" **to now read "5000.000 M3"**.
- b.) Item # 629.05 "Hand Labor Straight Time" change the quantity from "10.000 HR" **to now read "200.000 HR"**.
- c.) Item # 631.12 "All Purpose Excavator (Including Operator)" change the quantity from "15.000 HR" **to now read "50.000 HR"**.
- d.) Item # 631.172 "Truck Large (Including Operator)" change the quantity from "15.000 HR" **to now read "50.000 HR"**.
- e.) Item # 631.22 "Front End Loader (Including Operator)" change the quantity from "10.000 HR" **to now read "25.000 HR"**.
- f.) Item # 652.38 "Flagger" change the quantity from "5000.000 HR" **to now read "15000.000 HR"**.

5) On Plan Sheet # 11 of 280 titled "General Notes" make the following changes

a.) Delete note # 45 in its entirety and replace with the following new note # 45 which states; "A GEOTECHNICAL REPORT IS AVAILABLE FOR THE CONTRACTOR'S REFERENCE AT THE URBAN & ARTERIAL OFFICE IN WINTHROP. THE GEOTECHNICAL REPORT IS BASED ON DATA OBTAINED FROM SUBSURFACE EXPLORATIONS AT THE SITE. NO ASSURANCE IS GIVEN THAT THE DATA IS REPRESENTATIVE OF SUBSURFACE CONDITIONS BETWEEN BORING LOCATIONS."

b.) Delete note # 46 in its entirety and replace with the following new note # 46 which states; "FULL DEPTH RECYCLED PAVEMENT WITH FOAMED ASPHALT SHALL BE PLACED FULL WIDTH OF MAINLINE LANES AND SHOULDERS, INCLUDING AREAS OF WIDENING FOR TURNING LANES AT INTERSECTIONS, WITHIN THE FOLLOWING LIMITS:

STA. 9+280 TO STA. 9+440
STA. 10+060 TO STA. 16+621.243

REMOVAL OF ALL EXISTING BITUMINOUS MATERIAL IS REQUIRED PRIOR TO THE PLACEMENT OF THE VARIABLE GRAVEL. ALL EXISTING BITUMINOUS MATERIAL SHALL BE SALVAGED AND UTILIZED FOR THE FOAMED ASPHALT LAYER. PAVEMENT SALVAGED FROM STA. 9+440 TO 10+060 OR FROM OTHER AREAS ON THE PROJECT SHALL BE USED TO PROVIDE THE SPECIFIED THICKNESS OF RECYCLED PAVEMENT FOR THE FOAMED ASPHALT PROCESS IN WIDENED SECTIONS AND OTHER LOCATIONS IF NEEDED. IF ADDITIONAL RECYCLED PAVEMENT IS NEEDED, MATERIAL FROM OTHER SOURCES OFF THE PROJECT MAY BE USED IF APPROVED BY THE RESIDENT. SURPLUS MATERIAL WILL BE THE PROPERTY OF THE CONTRACTOR.

FURNISHING, TRANSPORTING, PLACING, GRADING AND OTHER REQUIRED HANDLING OF SUCH MATERIAL WILL NOT BE PAID DIRECTLY BUT WILL BE CONSIDERED INCIDENTAL TO THE BID PRICE FOR ITEM 309.30."

**6) ON ALL CONTRACT DOCUMENTS AND PLAN SHEETS DELETE ANY AND ALL
REFERENCE TO: "COLD-IN-PLACE RECYCLED PAVEMENT WITH FOAMED ASPHALT" AND
REPLACE WITH, "FULL DEPTH RECYCLED PAVEMENT WITH FOAMED ASPHALT"**

Make these changes in pen and ink.

Consider these changes prior to submitting your bid on June 11, 2003.

Sincerely

A handwritten signature in cursive script that reads "Bruce R. Carter".

Bruce R. Carter
Contracts Engineer

SPECIAL PROVISION
SECTION 309
FULL DEPTH RECYCLED PAVEMENT
(With Foamed Asphalt)

309.01 Description This work shall consist of pulverizing a portion of the existing roadway structure into a homogenous mass, treating the pulverized material with the foamed asphalt process, and the placing and compacting of this material to the lines, grades, and dimensions shown on the plans or established by the Resident.

MATERIALS

309.02 Pulverized Material Pulverized material shall consist of a portion, or the entire existing bituminous pavement and, if specified, a designated portion of the underlying gravel, pulverized and blended into a homogenous mass. Pulverized material will be processed to 100 percent passing a 50 mm [2 in] square mesh sieve.

309.021 New Aggregate and Additional Recycled Material New aggregate, if required by the contract or job mix, shall meet the requirements of Section 411.02 Untreated Aggregate Surface Course.

Recycled material shall consist of material from the project or from off-site stockpiles that have been processed, prior to use, to 100 percent passing a 50 mm [2 in] square mesh sieve. The Resident shall conditionally accept recycled material at the source; it shall be free of winter sand, granular fill, construction debris, and other materials not generally considered to be bituminous pavement.

309.022 Asphalt Binder The asphalt binder used in the foamed asphalt process shall be Performance Grade 64-28 meeting the requirements of Section 702.01.

309.023 Portland Cement The portland cement shall be Type I or II meeting the requirements of AASHTO M85-89.

309.024 Lime Lime for soil stabilization shall meet the requirements of AASHTO M216.

309.025 Crusher Dust Crusher dust, if required by the job mix, shall be free from friable or deleterious material, including excessive mica, and shall meet the following gradation requirements:

Sieve Size	Percent Passing
12.5 mm [1/2 in]	100
0.075 mm [No. 200]	10 - 15

Water Water shall be clean and free from deleterious concentrations of acids, alkalis, salts or other organic or chemical substances.

EQUIPMENT

309.03 Pulverizer The modified milling or recycling machine shall be a Wirtgen Model WR2500, Caterpillar Model RR350, or equal, and, as a minimum, shall have the following features:

- A. A minimum power capability of 600 horsepower;
- B. Where the recycling depth exceeds 250 mm [10 in], the effective volume of the mixing chamber shall be increased in relation to the depth of cut;
- C. Two microprocessor-controlled systems, complete with 2 independent pumping systems and spraybars, to regulate the application of foamed bitumen stabilizing agent, separate from water (for increasing the moisture content of the recycled material), in relation to the forward speed and mass of the material being recycled;
- D. Two spraybars shall each be fitted with self-cleaning nozzles at a maximum spacing of one nozzle for each 155 mm [6 in] width of the chamber;
- E. The foamed bitumen shall be produced at the spraybar in individual expansion chambers into which both hot bitumen and water are injected under pressure through individual and separate small orifices that promote atomization. The rate of addition of water into hot bitumen shall be kept at a constant (percentage by mass of bitumen) by the same microprocessor;
- F. An inspection (or test) nozzle shall be fitted at one end of the spraybar that produces a representative sample of foamed bitumen;
- G. An electrical heating system capable of maintaining the temperature of all bitumen flow components above 150°C [300°F];
- H. A single bitumen feed pipe installed between the modified milling or recycling machine and the supply tanker. Circulating systems that incorporate a return pipe to the supply tanker shall not be used;
- I. The operator cabin shall be variable from right to left;
- J. A printer shall be included to record amounts of materials used.
- K. The recycler shall be fitted with a front breaker bar system to ensure that the reclaimed material is broken down to the sizing outlined in 309.02.

In addition to the above features, it is an essential part of this specification that the recycler be capable of exactly reproducing the foaming characteristics produced by the foam lab, to ensure compliance with the mix design as well as correct dispersion of the foamed asphalt. To ensure that the recycling process in the field reproduces the lab mix design, the recycler shall be fitted with the same type of foam expansion chambers as the lab foaming unit.

309.04 Liquid Mixer Unit or Distributor Only tankers with a capacity exceeding 10,000 L [2500 gal] shall be used to supply the recycling machine with bitumen. Each tanker shall be fitted with two recessed pin-type tow hitches, one in front and the other behind, thereby allowing the tanker to be pushed from behind by the recycling machine, and to push a water tanker in front. No leaking tanker will be permitted on the job site. In addition, each tanker shall be equipped with the following:

- A. A thermometer to show the temperature of the contents in the bottom third of the tank;
- B. A rear feed valve, with a minimum internal diameter of 75 mm [3 in], capable of draining the contents of the tank when fully opened;
- C. Insulation to retain heat; and
- D. A calibrated dipstick marked at intervals of no more than 100 L [25 gal], for measuring the contents of the tank.

309.05 Placement Equipment Placement of the full depth recycled material to the required slope and grade shall be done with an approved highway grader or by another method approved by the Resident.

309.06 Rollers The full depth recycled material shall be rolled with a vibratory pad/tamping foot roller, a vibratory steel drum soil compactor and a Type II pneumatic tire roller. The pad/tamping foot roller drum shall have a minimum of 112 tamping feet 73 mm [3 in] in height and a minimum contact area per foot of 110 cm² [17 in²]. The vibratory steel drum roller shall have a minimum 2.15 meter [84 in] width single drum. The pneumatic tire roller shall meet the requirements of Section 401.10 and the minimum allowable tire pressure shall be 586 kPa [85 psi].

MIX DESIGN

The Full Depth Recycled Pavement (With Foamed Asphalt) mix design will be treated with the following material proportions:

PG 64-28 asphalt binder	3.5 %
Water needed to ensure proper foaming	3.0 %
Portland Cement (Type I or II)	3.0 %

The optimum moisture content for compaction shall be determined by the Department using samples obtained from the pulverized material prior to the addition of the foamed asphalt, by means of AASHTO T 180, Method D.

CONSTRUCTION REQUIREMENTS

309.07 Pulverizing The entire depth of existing pavement on the travel way shall be pulverized together with approximately 50 mm [2 in] of the underlying gravel into a homogeneous mass.

All pulverizing shall be done with equipment that will provide a homogeneous mass of pulverized material, processed in-place, which will pass a 50 mm [2 in] square mesh sieve.

309.08 Weather Limitations When foamed asphalt is used, full depth recycled work shall not be performed when the atmospheric temperature is below 10°C [50°F], during wet conditions, or when weather conditions are such that proper pulverizing, adding and mixing foamed asphalt are unfavorable to proper construction procedure, or compaction of the pulverized material cannot

be accomplished. Spreading of lime or cement on the roadway ahead of the recycling machine will not be allowed when windy conditions adversely affect the operation.

309.09 Surface Tolerance The completed surface of the full depth recycled course shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of 10 mm [3/8 in].

309.10 Full Depth Recycling Procedure If required by the mix design in order to achieve proper dispersion of the foamed asphalt, a uniform layer of crusher dust shall be spread over the full width of the roadway. The material shall then be pulverized, processed, and blended into a homogeneous mass passing a 50 mm [2 in] square mesh sieve. Material found not pulverized down to a 50mm [2 in] size will be required to be reprocessed by the recycler with successive passes until approved by the Resident.

The material shall then be shaped to the cross-slope and grade shown on the plans, typicals, or as directed by the Resident. New aggregate or recycled pavement meeting the requirements of Section 309.021 - New Aggregate and Recycled Material, of this Special Provision, shall be added as necessary to restore cross-slope and/or grade. Locations will be shown on the plans or described in the construction notes; the Resident may add other locations while construction of the project is in progress. The Contractor will use recycled pavement to the extent it is available, in lieu of new aggregate.

The dry stabilizing agents (lime or cement) shall be spread uniformly over the full width of roadway to be recycled prior to each pass of the recycling machine, in a continuous process, either by means of a mechanical spreader or by hand. Dry stabilizing agents shall be spread at the prescribed rate of application provided by the Department. Foamed asphalt shall be incorporated into the material to a depth determined by the pavement design. These additives shall then be uniformly blended into a homogeneous mass until an apparent uniform distribution has occurred. The Resident may adjust the rate of application as necessary. The resultant material shall be graded and compacted to the cross-slope and profile shown on the plans or as directed by the Resident. The Contractor will also be responsible for re-establishing the existing profile grade.

Asphalt binder shall be added to the milling or recycling process by pumping from a mobile bulk tanker that is pushed from behind by the recycling machine. Tankers shall be equipped with a built-in thermometer to ensure that the bituminous stabilizing agent is maintained at $180^{\circ}\text{C} \pm 5^{\circ}\text{C}$ [$350^{\circ}\text{F} \pm 10^{\circ}\text{F}$]. Bitumen that has been heated above 220°C [425°F] shall not be used for producing foamed bitumen and shall be removed from the site. The system employed to add the foamed asphalt to the recycling process shall conform to the equipment requirements specified in these Special Provisions. The Contractor shall verify bituminous stabilizing agent (asphalt) usage quantities by measuring tanker volume every 300 meters [1000 ft] recycled. At the end of each workday the measurements shall be reported to the Resident.

Sufficient water shall be added during the recycling process to meet the moisture requirements as specified. Water shall be added only by means of the microprocessor control system on the recycling machine and care shall be taken to prevent excessive wetting.

June 6, 2003

Test strip The contractor shall assemble all items of equipment for the recycling operation on the first day of the foamed asphalt work. The Contractor shall construct a test strip for the project at a location approved by the Resident. The contractor shall have on site a pavement engineer expert in foamed asphalt work to control the test strip, advise on suitability of mixed material, bitumen dispersion within the mixed material, moisture control within the mixed material, compaction and surface finish. The test strip section is required to:

- A. Demonstrate that the equipment and processes can produce recycled layers to meet the requirements specified in these special provisions;
- B. Determine the effect on the grading of the recycled material by varying the forward speed of the recycling machine and the rotation rate of the milling drum; and;
- C. Determine the sequence and manner of rolling necessary to obtain the minimum compaction requirements.

The test strip shall be at least 100 m [330 ft] in length of a full lane-width (or a half-road width).

The Contractor shall repeat the test strip process until parameters of the material properties conform to the requirements specified herein and as directed by the Resident. If a test strip fails to meet the requirements outlined in this Special Provision, the contractor will be required to take corrective action to remedy the test strip defect to the satisfaction of the Resident at no additional cost to the Department. The repeated process of the test strip construction shall be done at the Contractor's expense. The corrective method shall be determined by the Contractor, as directed by the Resident.

Density of the recycled material will be determined by the Department using the nuclear method. After the test strip has been pulverized, the foamed asphalt added and mixed, and the roadway brought to proper shape, it will be rolled as directed until the nuclear density readings show an increase in dry density of less than 16 kg/m³ [1 pcf] for the final four roller passes. This density will be used as the target density for the recycled material. The remaining full depth recycled material shall be compacted to a minimum density of 98% of the target density as determined in the control section.

After compaction, the roadway surface shall be treated with a light application of water, and rolled with pneumatic-tired rollers to create a close-knit texture. The finished layer shall be free from:

- A. Surface laminations,
- B. Segregation of fine and coarse aggregate, and
- C. Corrugations or any other defects that may adversely affect the performance of the layer.

The Contractor shall protect and maintain the recycled layer until the next layer or surfacing is applied. Frequent light watering shall be performed to prevent the surface from drying out. Any damage or defects in the layer shall be repaired immediately as directed by the Resident. An even and uniform surface shall be maintained. Repairs and maintenance for the recycled layers during, and after the curing period has elapsed, resulting from damage caused by traffic, weather or environmental conditions, or resulting from damage caused by the Contractor's operations or

equipment, shall be completed at no additional cost to the Department. Any repair methods shall be subject to approval by the Resident prior to any repairs being made.

309.11 Miscellaneous No new pavement shall be placed on the full depth recycled pavement until a curing period of **36 hours** has elapsed.

309.12 Method of Measurement Full Depth recycled material (with Foamed Asphalt) will be measured by the square meter. Materials added to restore grade and/or cross-slope in areas not shown on the plans or described in the construction notes shall be measured in vehicles at the point of delivery or by some other method mutually agreeable to the Contractor and the Resident.

309.13 Basis of Payment The accepted quantity of Full Depth Recycled Pavement with Foamed Asphalt shall be paid for at the contract unit price per square meter, complete in-place to the specified limits, which price shall be full compensation for furnishing all equipment and labor for pulverizing, blending, placing, grading, compacting and for all incidentals necessary to complete the work including asphalt binder, water, portland cement, lime, and crusher dust.

Adding materials to restore grade and/or cross-slope in areas shown on the plans will be paid separately under Item 410.10 Untreated Aggregate Surface Course (Truck Measure). Adding materials in areas not shown on the plans will be paid under Item 410.10 Untreated Aggregate Surface Course (Truck Measure).

Payments will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
309.30 Full Depth Recycled Pavement With Foamed Asphalt	Square Meter (SY)